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## Home Range of the Southern Woodchuck

By RICHARD F. TRUMP

In this study of the home range of the woodchuck, *Marmota monax monax* (L.), the mammals were live-trapped and marked with metal ear tags. Data from 65 catches of 47 specimens in Van Buren County, 1940-1941, from the writer's master of science thesis (Iowa State College, 1943), along with data from 58 catches of 24 specimens in Story County, 1946-1949, are incorporated in this report.

Ten to 15 traps were used, largely during the months of June, July, and August. They were set in the runways near dens and were moved frequently to new locations, seldom remaining at one den as long as a week. The dens were selected on the basis of sign, without regard to any sort of grid pattern. Although baiting was found unnecessary, the use of soft ear-corn appeared to increase trapping success. Construction of the traps and the technique of trapping and tagging are described in three previous publications (Trump, 1943a and b; Trump and Hendrickson, 1943).

Data on the home range of the woodchuck were obtained from two sources — from retrapping of tagged individuals and from observations on specimens which ran to other dens when released. Den locations were plotted on base maps and (in Story County) on aerial photographs copied from Soil Conservation Service pictures. The prints were underexposed, with only the salient features of the landscape revealed (Trump and Hendrickson, 1949). These prints provided accurate base maps for use in the field and for calculating distances between dens.

Of the 71 specimens tagged, 43 were caught only once; 15 were taken twice; seven were taken three times; four were taken four times; one was taken six times; and one seven times. These 52 returns are summarized in Table 1. The distribution of catches by month was as follows: March — 1; June — 20; July — 47; August — 50; September — 2; and October — 3.

### BEHAVIOR OBSERVATION IN HOME RANGE STUDY

The use of behavior observations as a technique for home range study was suggested when specimens, released near their dens, ran to other dens which were not visible from the point of release. Experience indicated that when woodchucks were moved greater distances from the point of capture, their retreat suggested confusion and random search for a burrow. On several occasions when

the mammals were released more than a half mile from the point of capture, they took refuge in scant cover (once under the writer's car), even though burrows were easily accessible. This behavior is in sharp contrast to the swift, direct retreat of woodchucks re-

**Table 1**

Home Range as Indicated by Returns and Observations of Released specimens.

Specimen	Number of catches	Number of records by observations	Interval in days	Home range distance in yards	Home range area in yards
1388, young ♀	1	1	0	108	-----
1389, adult ♂	1	1	0	258	-----
1392, adult ♀	1	1	0	168	-----
1393, adult ♀	1	1	0	570	-----
9201, adult ♀	2	1	7	240	2640
9213, young ♀	3	1	26	152	6508
9219, young ♀	1	1	0	154	-----
9220, adult ♂	1	1	0	56	-----
9238, adult ♂	3	1	43	127	5330
9224, young ♂	2	2	17	168	1008
9235, young ♀	1	1	0	28	-----
A144, adult ♀	3	2	12	342	19001
A147, adult ♀	2	0	108	503	-----
A902, adult ♂	4	1	143	590	143688
A906, young ♂	2	0	19	0	-----
A908, young ♀	3	0	4	227	2848
A910, adult ♀	2	0	21	60	-----
A912, adult ♂	6	0	35	335	40955
A914, adult ♂	2	1	5	226	1887
A953, adult ♀	2	0	47	482	-----
A957, adult ♂	2	0	40	501	-----
A959, adult ♂	2	0	52	121	-----
A962, adult ♀	7	1	1063	138	1449
9221, young	2	1	16	99	2090
A963, adult ♂	2	2	374	211	7098
A966, adult ♀	4	0	71	482	10103
A970, adult ♂	3	0	53	184	1933
A971, adult ♀	4	0	774	549	14749

leased a hundred yards or so from their own dens. Detailed description of the behavior of seven specimens has been previously reported (Trump, 1943b). Of the records used in this study, 20 were obtained from observations of released specimens while 69 were from actual catches.

## SIZE OF HOME RANGE

A number of field observers have referred to the relatively small home range of the woodchuck. Silver (1928) says, "Woodchucks depend for their safety on their ability to get into a burrow on short notice. They quickly reopen any closed burrows within their range, which sometimes extends a half a mile from the home den. . . ."

Seton (1929) remarks, ". . . ordinarily it does not go more than 100 yards from home." After extensive studies of the life history of woodchucks in New York, Hamilton (1939) writes, "Woodchucks will occasionally travel a distance of several hundred yards from their den to visit an orchard and feed on drops, but these extensive movements, for small rodents, usually are the result of insufficient food supply within a few yards of their home quarters."

The above writers have based their conclusions largely on observations of the eastern subspecies, *rufescens*. Twichell (1939), who studied the southern subspecies, *monax*, remarked that he had seen only one specimen more than 100 feet from its den.

The findings on home range in this study are summarized in Table 2. In view of the greater number of cases available, it appears that the greatest distance between points in the known range is more significant than the area of the range; this measurement is called *home range distance*. As further data are obtained it will be desirable to use the area as an expression of home range.

Table 2

Range Data on Basis of Age and Sex

	Adult ♂	Adult ♀	Young
Number of cases.....	10	10	8
Mean home range distance.....	261	353	96
Standard Deviation .....	161	180	70

## SUMMARY

1. During June, July, and August, there was considerable overlapping of relatively small home ranges.

2. The greatest known home range distance, 590 yards, was for an adult male numbered A902 which was caught four times from March 28 to August 18, 1949.

3. For specimens whose records extended from zero to 35 days, the mean home range distance was 184 yards, with a standard deviation of 129. For specimens with records extending more than 35 days the distance was 353 yards, the standard deviation being 120.

4. The mean home range distance varied with the number of

records (catches and observations): two records — 209 yards with a standard deviation of 191; three records — 195 yards with a standard deviation of 52; four records — 281 yards and a standard deviation of 169. There was a single case with six records, the distance being 335 yards, and another case with eight records and a distance of 138 yards.

5. The specimen with eight records and a home range distance of 138 yards was an adult female, number A962. It was trapped seven times — five times at the same den.

6. The use of a den by more than one adult woodchuck is of interest in relation to possible territorial behavior.

(a) At ten dens only one mature female was trapped. At eleven dens a single adult male was taken.

(b) At each of seven dens one male and one female were taken, the intervals between the catches ranging from seven to 50 days.

(c) At three dens two males were trapped on the following dates: July 12 and July 31; July 30 and July 31; August 17 and August 18.

(d) At one den two females were trapped, one on July 28, the other on August 17.

(e) At one den a male was taken on June 11 and females on June 27 and July 4.

7. The sex ratio of the woodchucks tagged was 32 males to 39 females.

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